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ABSTRACT

Reflective teaching has been one of the three main goals of the preservice teacher education programs in the National Institute of Education, Singapore, since the late 1980s. A three-phase study, of which the first two phases are described, is examining how Singapore student teachers think about teaching in the preservice programs, how they identify the constraints they have about teaching, how they identify learning problems, and what happens to their teaching behaviors as they move through the programs into teaching practice and into the first year of teaching. In Phase One, 78 preservice student teachers from undergraduate and graduate programs viewed a videotape of a classroom lesson on road safety and were asked to critique the lesson; the critiques were then rated on their level of reflective thinking. In Phase Two, 18 undergraduate and graduate students described in journal writing their reflections on 5 classroom episodes, and their level of reflective writing was evaluated. Results indicated that the level of reflective thinking for both undergraduate and graduate level student teachers began at a low level, but those with more subject matter knowledge and skills or working experience (graduate level students) improved at a faster rate. Implications of the study and recommendations are discussed. Appendixes contain a lesson evaluation form and weekly journal writing guidelines. (Contains 29 references.) (JDD)

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ON IMPROVING REFLECTIVE THINKING THROUGH TEACHER EDUCATION

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ON IMPROVING REFLECTIVE THINKING THROUGH TEACHER EDUCATION

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Introduction

The study of reflective thinking of teachers has become one of the most productive lines of inquiry into effective teaching during the past few decades. Research on preservice teacher thinking has focussed largely on student teachers and such research, while examining and confirming differences in the reflective thinking of beginning and experienced teachers, has also provided conflicting results about whether the cognition of preservice teachers changed as a result of school experience or teaching practice. There are also differences in the definition of reflective thinking and the expected outcome of reflective practice.

In the United States, four distinct traditions of reflection in teacher education which have guided reform efforts, have been noted (Zeichner and Liston, 1990). In the light of these four traditions of practice, four varieties of reflective teaching practice have been identified: (1) an *academic* version that stresses reflection upon subject matter and the representation and translation of subject matter knowledge to promote student understanding, (2) a *social efficiency* version that emphasizes either the mechanical or thoughtful application of particular teaching strategies that have been suggested by a knowledge base external to the practice being studied; (3) a *developmentalist* version that prioritizes teaching that is sensitive to students' interests, thinking, and patterns of developmental growth; and, (4) a *social reconstructionist* version that stresses reflection about the institutional, social, and political contexts of schooling and the assessment of classroom actions for bringing about greater equality and justice in schooling and society (Zeichner, 1991). Grimmett, et al. (1990) identified three major conceptual orientations to reflective practice : the *source* of knowledge that is reflected upon, the *mode* of knowing and the *use* to which knowledge is put as a result of the reflective process. Valli (1990) like Tom (1985) emphasized the moral foundations of teaching and distinguished three approaches to reflective teacher education: the deliberative-technical approach, the relational-caring approach and the critical approach which helps "give voice" to teachers.

In Australia, at least three versions of reflective teaching can be identified. They are the social efficiency, the developmentalist and the social reconstructionist versions, similar to those found in the United States. The social reconstructionist version has featured most prominently in Australia in recent years. Advocates of social change, such as the Western Australian School of Critical Theory, have asserted that reflection is a dialectal process - it looks inward at our thoughts and thought processes and outward at the situation (Kemmis, 1989). The Australian researchers share similar concerns as the American School of Social Reconstruction that the benefits of reflective teaching lies in the ability to reconstruct many of the taken-for-granted assumptions about teaching, that is, the ability to change and redefine learning and teaching in both schools and the wider social contexts. This would include the change of textbooks, teaching styles, school organization, student tasks, or interaction patterns (Grimmett, et al. 1990). They suggest that empowerment and freedom in learning and use of emancipatory strategies in their attempts to involve student teachers to think, redefine and make changes should characterise reflective teaching practice.

Conceptualisation of Reflective Teaching in Singapore

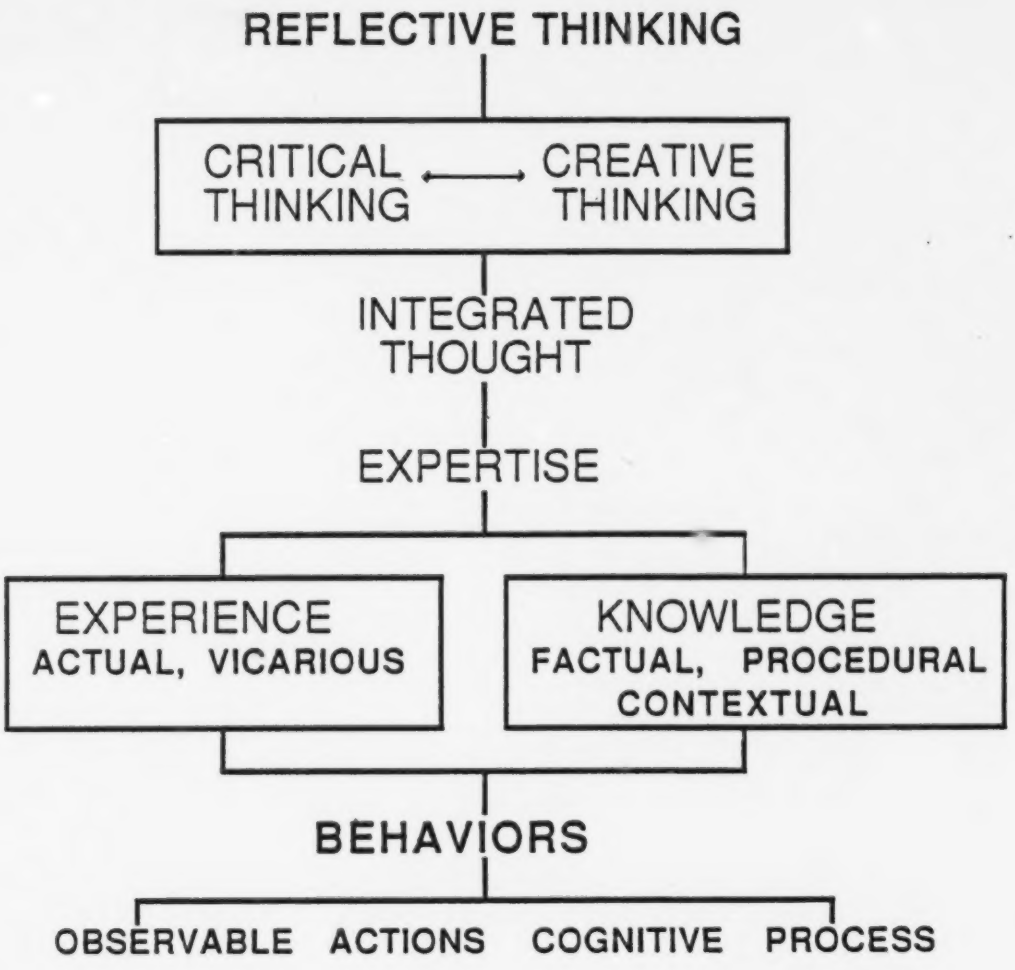
In working toward innovation and improvement in teacher education in Singapore, it is important to have visions of the kinds of teachers required for the 21st Century, to be aware of national needs and the children's needs and interests, as well as the tools, methods, techniques, delivery systems, environmental design, and theories of cognition and learning that we bring to bear. It is not enough for teachers just to know about the subject and the children they teach. They have to learn how to learn to keep pace with the rapid developments in the economic, political and scientific realms and the impact upon the children of tomorrow. Teachers nowadays have to be more responsive to the changes in and around them. This means that they have to be more self-regulated, self-directed and self-actualizing. They have to be more reflective in their practice so that they can change their behavior according to the needs and demands of the situation.

Reflective teaching has been one of the three main goals of the preservice teacher education programs in the National Institute of Education (NIE), Singapore since the late 1980's. The other two goals focussing on the professional education of knowledgeable and competent teachers have been the aims of teacher education in Singapore for the past 40 years. Expanding the aims of teacher education is due to several reasons, among them, the need for teachers to develop their pedagogical habits and skills in tandam with advances in our understanding of cognition and learning, the design of instructional innovations, and the rapid economic, social, political, scientific and technological changes in the world and in Southeast Asia.

Though reflective inquiry has been the guiding theme in all of the academic, curriculum and education courses as well as the practicum of all the four NIE undergraduate and postgraduate diploma in education programs, little is known about the source, mode, use, process, and product of the student teachers' reflection on their knowledge about the subject matter, pedagogy, students and the social context. While some research has been done regarding student teachers' expertise (Chen, et al 1988, 89, 90, 91)cognitive and learning styles (Yeap & Wong, 1991) and learning strategies (Chang, 1991) and how these may have an effect on their pupils but there is no study on how student teachers develop pedagogical knowledge and skills necessary for self-directed professional growth.

Reflective thinking is an integrative thought process. It is an interaction of critical thinking and creative thinking in the course of problem solving and decision making (Table 1). It connects a teacher's private thought process with the social context. As one considers what one knows about the content, the pupils and instructional strategies and materials for the classroom and the school, one has to decide on the best representations of that knowledge in terms that are understandable and appreciated by the pupils. This dialectal interaction between critical and creative thought process is operational at all times while the student teacher is planning future teaching actions, or reflecting on the present teaching act, or the wisdom of past practices as recommended by the NIE lecturers/ supervisors and the cooperating teachers in schools. A teacher could make certain choices and monitor them by analysing and evaluating the decision in terms of observable actions and cognitive processes.

Undoubtedly both reflective thinking and reflective teaching are very complex processes including both the personal and social dimensions. Reflective teaching should not be examined either from only one perspective, be it personal or social, rational or moral, or from one particular approach: academic, social efficiency, developmentalist or social reconstructionist. All factors and dimensions that may contribute to the development of reflective thinking and reflective teaching should be considered.



CAY/RT-MODEL

TABLE I

There are assumptions about reflective thinking in current research literature that should be examined. The following are those that would be re-looked at as NIE reviews its teacher education programs, their goals, thrusts, structure, and delivery modes and systems.

Assumptions To Be Examined

1. Graduates in academic disciplines are generally more effective classroom teachers and are, therefore, more reflective about teaching than non-graduates and graduates not having been educated in an academic discipline.

2. Experiencedd teachers have more knowledge about the subject, their pupils, and teaching strategies and are more reflective than novice teachers.

3. Teachers who are more sensitive to the social context and the assessment of classroom activities would be more reflective and committed to bringing about social change.

4. Teachers who are sensitive to pupils' interests, learning styles, thinking and patterns of developmental growth would be more reflective resulting in more self-regulated behaviours.

5. Well designed programs which are taught by good lecturers/supervisors will nurture motivated and self-actualizing teachers.

Research Questions

Against the background of renewed interest and concern to improve the reflection of teachers, a study on improving the reflective thinking of student teachers through the NIE coursework and practicum was proposed in 1991.The following research questions have been raised in the Singapore study:

1. Are undergraduate and graduate student teachers able to reflect on a given teaching episode and give reasons for some successul teaching actions ?

2. If they are able to reflect, what do they think about the teaching episodes and actions, particularly of their own teaching?

3. Are the teaching actions based on some instructional principles and / or learning theories ?

4. Do contextual factors affect the application of the instructional principles and learning theories, and impede their teaching actions ?

5. Are the contextual factors related to some moral or ethical, social or political issues ?

6. Does improvement in reflection lead to improvement in teaching behavior and success in student learning ?

7. What are the best strategies for encouraging reflection on practice ?

Research Design and Data Collection

This study uses both quantitative and qualitative methods to inquire into the student teachers' thinking. It is our intention to examine how student teachers think about teaching in the preservice programs, how they identify the constraints they have about teaching, how they identify learning problems and to see what happens to their teachng behaviors as they move through the programs into teaching practice and into the first year of teaching.

Methodology

The study is being carried out in three phases. The first two phases of the research which are reported here focused on how preservice student teachers thought about classroom teaching in general and their own teaching in particular. The first phase is an attempt to describe the novice teachers' initial reflective thoughts and the second study explores how journal writing helps the student teachers to reflect on their own practice. For both the two phases of study, the RPT Framework (Framework for Reflective Pedagogical Thinking) of East Michigan University (Sparks-Langer et. al.1990) is adapted for use among the Singapore student teachers for the stimulated recall and reflection (see Appendix One, The Reflective Teaching Questionnaire), and the structured journal writing (see Appendix Two, Weekly Journal Writing Guideline).

Phase One or the Entry Phase involved all the student teachers in the 1991 cohort of NIE's preservice programs for primary teaching. There are 122 students in the BA/BSc 4-year program, 450 non-graduate students in the 2-year Diploma in Education program and 234 graduate students in the 1-year Postgraduate Diploma in Education (Primary) program. All the student teachers were then going through their first year initial professional primary teacher preparation. They had not been exposed to instructional theories and strategies though they had acquired some subject matter knowledge and pedagogical content knowledge or skills during the term of study. The students were asked to view a video tape of a classroom English language lesson for Primary Five pupils. The lesson was taught by an experienced teacher on the theme Road Safety. Using the stimulated recall method, the student teachers were then asked to critique the lesson according to four questions raised (Appendix One).

During Phase Two, a random sample of about 40 student teachers in the Diploma in Education and Postgraduate Diploma in Education programs supervised by members of the research team, were invited to participate in journal writing. They were asked to follow some guidelines intended to stimulate their reflective thinking and to tap their personal, ethical and social concerns (Appendix Two).

Phase One of Study and Results

78 preservice student teacher were randomly drawn from the 2 nongraduate and 1 graduate NIE preservice teacher education programs. These were students who had the necessary qualification and language proficiency and had been successful in interviews and admitted into the programs. For non-graduates, they have a minimum of a 'A' level Cambridge High School Certificate. For the graduates, they possess at least a degree from a recognized university. Altogether 54 students were drawn from the non-graduate pool and 24 from the graduate pool.

In order to determine the nature of reflective thinking, the Framework for Reflective Pedagogical Thinking (RPT) is used. This is based on an evaluation study on reflective thinking of trainee teachers done by Sparks-Langer et.al. (1990). The RPT Framework attempts to describe and determine the type of reflective thinking shown by the respondents. It includes seven levels:

4.

Framework for Reflective Thinking

Level	Description
1.	No descriptive language
2.	Simple, layperson description
3.	Events labeled with appropriate terms
4.	Explanation with tradition or personal preference given as rationale
5.	Expalanation with principle or theory given as the rationale
6.	Explanation with principle/theory and consideration of context factors
7.	Explanation with consideration of ethical, moral, politcal issues

Sparks-Langer et. al. (1990)

The progression in levels shows a growing sophistication of the teacher's cognitive constructs about teaching from very technical concepts and rules to more contextual and ethical thinking. All students in the First Phase of Study were asked to comment on a videotaped classroom episode and write their answers on a prescribed form - The Reflective Thinking Questionnaire. The tape was shown to the students at the initial phase of training at the beginning of term. They were asked to describe the episode, refer to successful teaching actions in the episode, and make a generalization about the episode related to any broader societal or professional issues that are thought provoking.

Four faculty members used the RPT Framework to rate the students' written responses independently and blindly; the interrater reliability was .78 . Out of the total of 78 student teachers, none were functioning at levels 1, 6 and 7. The majority of students were at Level 3 (42.3%) and Level 4 (37.1%). The average mean RPT score is 3.48 (see Table 2).

Table 2

Program	Mean	SD	N
Dip Ed	3.5	.804	42
BA/BSc	3.58	.193	12
PGDE	3.38	.189	24

The non-graduates, particularly those in the BA/BSc program, appeared to show a slightly higher level of reflective thinking. This is an interesting finding contrary to the general belief that teachers with greater subject matter knowledge should be able to reflect on a teaching act at a higher level.

Phase Two of Study and Results

18 students from two program groups: the Diploma in Education (non-graduates) and the Postgraduate Diploma in Education (graduates) were randomly sampled to form a small cohort for a longitudinal study. These students were asked to describe in journal writing their reflection on 5 classroom episodes. For each they were to identify and reflect upon episodes which contain problematic teaching/learning concepts or strategies or issues. The questions for the journal writing have been prepared to closely parallel the levels of reflection in the RPT Framework (see Appendix Two). The student teachers were observed and interviewed as they move from pre-practicum through practicum (teaching practice).

An analysis of the student teachers' journal writing shows that the non-graduate and graduate students are reflecting at levels 3 through 6 on the RPT Framework. The overall mean rating was slightly higher for the graduate students than the non-graduates but not of significance. Many of them have not yet reached the principle pedagogical thinking of Level 5 (see Table 3). Though there are a few student teachers who are at levels 5 and 6.These results are compared with data obtained during classroom teaching observations and interviews made during the practicum. Some tentative conclusions have been reached based on the data collected.

5.

Table 3

Demographic Characteristics and RPT Scores in the DE and PGDE (Pri) Programs

Program	Subject	Gender	Age	RPT Scores Videotape	RPT Scores Journal
DE	001	F	22	2.5	4.4
(non-grads)	002	F	19	2	2.8
	003	F	20	3	4.3
	004	F	21	6	5.7
	005	F	21	5	4.6
	006	F	21	5	4
	007	F	21	4	5.2
	008	F	19	3	3.2
	009	F	21	5	3.75
Mean			20.5	3.94	4.22
PGDE	010	F	25	4	3.5
(grads)	011	F	22	4	5.2
	012	F	23	2	3.7
	013	M	26	5	4.4
	014	F	26	4	4.8
	015	M	26	3	4.6
	016	F	22	3	3,4
	017	F	32	4	4.3
	018	F	29	5	4.3
Mean			25.7	3.8	4.24

Phase Three of Study

A purposive sample of 6 teachers from the 18 student teachers of the two programs of the low, medium and high levels of reflective thinking will be further observed and interviewed. They will also be asked to continue to write journals. Data collected from these studies will be analysed to see whether they support, elaborate or substantiate the tentative findings of the Phase Two of Study.

Discussion

For both Phase One and Phase Two of study, it was expected that student teachers in the Diploma in Education(non graduate) program would have more difficulty applying the pedagogical concepts and principles than the PGDE (grad) program but this was not significantly borne out. The reason could be that at the initial phase of training when everyone is new to the concepts and principles of the field, the level of reflective thinking for all student teachers will fall to that of a layman irrespective of their academic background. However with coaching and learning, those with more subject matter knowledge and skills or working experience, particularly in relief teaching, will improve at a faster rate. Hence the results of the findings from Phase One to Phase Two of the study.

6.

One DE student teacher (007) has one year of relief teaching experience before joining the DE program. In Phase One of the Study, she was able to describe a teaching episode using pedagogical priniciples (Level 5) e.g.

> "What I feel is that, if the teacher is warm and has enthusiasm in wanting to impart knowledge to the children to ensure their understanding of certain concepts, she will strive her best to make them understand. For a lesson to be successful, I feel that there's a need for interaction and participation among the teacher and the children. Having a non-threatening atmosphere with the children will enhance learning in group teaching."

After 3 weeks of teaching practice in school, this same student teacher wrote showing greater awareness of pupil needs and learning:

> " I met with him after class and taught him how to spell four words. The boy spelt all the four words correctly..From our meeting, I realised that this boy could learn and quite easily too, given the proper motivation, experiences and guidance...This boy is in this position because he is basically left on his own to do whatever he wishes at home."

Others on the DE program shows similar improvement in their reflection as they were able to use pedagogical principles in thinking about their lessons, eg.

C.A. (005) wrote aboute her use of flashcards in a music lesson:

> " I realised that if I had to revise the names of different notes and rests through teaching them again, the children would definitely be bored...so I decided to play a game with them using the flashcards...The children seemed to enjoy themselves and learned at the same time."

L. C. (003) wrote about her management skills:

> " While I was doing my evaluation of that day's lesson, I realised that I had made a mistake. I learned that I should not have grouped them up into such a big group... It is hard to get them not to talk so loudly so that they can be heard."

The PGDE student teachers show a little more understanding to the problematic teaching situations in their journal writing than in the Reflective Thinking Questionnaire, eg. one of the top students during teaching practice (018), who is a Social Science graduate and has four years of working experience in a management position, in responding to the question "Does this teaching episode bring to mind broader societal or professional issues that are thought provoking to you ?" in Phase One of the Study:

> "As I observed the teaching episode, I began to consider other possible alternative teaching strategies - guided groupwork or small group discussion that can stimulate greater pupil participation and discovery learning."
>
> Three weeks into Teaching Practice, she wrote about using stories to teach Maths at Primary Three Level showing greater understanding of instructional principles and greater ability to implement the principles:
>
> " This episode was significant because it showed the great potential of using stories with concrete materials in maths teaching. In fact Maths and English could be more

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integrated in the curriculum... Pupils were keen to learn, and were excited to participate in the development of the story."

The other PGDE student teachers show similar improvement in their reflective thinking even though they were not performing in as high a level as Student 018, eg.

Student teacher (014) wrote about her own over-teaching to Primary 5 pupils in a Science lesson. She is a Business Administration Grad with three years of working experience. The journal shows greater awareness of students' needs besides her own teaching behaviors and greater commitment to change:

> " Today is my supervisor's second observation..., the topic was on reproduction of non-flowering plants...The lesson was conducted smoothly. The kids had the opportunity to observe the specimen while I explained. They handled the materials, did some recording on the worksheets I had prepared... However, at the end of the lesson, I realised that the brighter kids enjoyed the fast pace but the average kids were confused and got all muddled up with all the concepts that I've taught...I should have chunked the info and taught at a slower pace...I have to re-teach some of it again the next day."

Another student teacher (013) shows greater awareness of contextual factors and more social concern in his English and Science lessons for Primary Five pupils. He is an Arts Graduate:

> " The lesson provided an opportunity for me to teach the pupils on the social and moral responsibility of any invention. The lesson on gunpowder enabled the pupils to discuss whether the invention helped or harmed mankind...It was initially meant for clearing hills and blowing up tunnels for mining. However, it was used to make bombs to destroy enemies."

> " In this lesson, the use of the Accidents and Emergency Unit in the hospital was discussed. The A & E Unit was meant for those who needed immediate attention. However, many patients use it for minor sickness and accidents. In their discussion the pupils understand the moral responsibilities and social principles involved in using public facilities for one's own personal benefits and ignore the welfare of others."

Implications and Recommendations

From the experience and findings of the two studies, it would be interesting for us to probe further:-

1. What caused the greater increase in reflective thinking among the graduate student teachers during the practicum and whether reflective thinking help enhance the teachers' professional development, at least during the first year of their work as qualified teachers.

2. Whether there is truly a relation between experience, knowledge of subject matter, reflective thinking and effective teaching.

An on-going process of this study is a refinement of an interview schedule which will be used on the longitudinal study of the 18 student teachers. The interview method would be the most appropriate and potentially valuable way to collect RPT data. An in-depth face-to-face interview is

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being planned for Phase Three of the Study. We believe that teachers' reflective thoughts can be assessed directly, through asking them questions about how they thought about teaching, and providing them a situation and context in which they would feel comfortable in sharing these thoughts. We hope to generate a sufficiently rich database for the next phase of study.

On the teacher education front, we are convinced that coaching for reflective thinking is valuable in enhancing the student teachers' cognitive, pedagogical and professional development. This can be carried out during clinical supervision sessions which should be more systematically and comprehensively implemented, that is as many of the lecturer/supervisors be persuaded to commit themselves to the supervision cycle and coaching their supervisees for reflective practice.

For professional practice, we believe that teachers who reflect on their practice would be more inclined to find better ways of teaching different types of pupils than just using the whole class teaching method all the time. For teachers to be more self-regulated, self-directed and self-actualized, it is important that they critically analyse their own teaching in the context of changing pupil and societal needs and demands and make creative and practical decisions and firm commitment to the education of the young.

Conclusion

As the study is only half-way through, it is our hope that some of the findings will either confirm, or in fact, contradict many of the well-cherished assumptions about thinking and about learning how to teach. It is hoped that the findings and conclusions reached will assist in the unceasing efforts made to improve the forms and systems of teacher education in Singapore.

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NATIONAL INSTITUTE OF EDUCATION

Framework for Pedagogical Thinking

Name: _____ NRIC: _____

Sex: M / F Age: _____ Date: _____

Programme (Tick whichever is applicable)

BA/BSc	( )	Dip Ed (General)	( )	PGDE (Pri)	( )
BA/PE	( )	Dip Ed (L2/Art/Music Specialist)	( )		
BSc/PE	( )	Dip Ed (PE)	( )	Year of Study: 1 / 2 / 3 / 4	

1. Describe the **teaching episode** in as much detail as you can remember.

2. Select a **teaching action** that seemed successful to you. Why do you think it proved to be successful?

3. Do you think there are any conditions in this particular **teaching episode** that influenced the success of that **teaching** action? Do you think any teacher could do the same thing any time with any group of pupils? Explain.

4. Does this **teaching episode** bring to mind any broader societal or professional issues that are thought provoking to you?

APPENDIX TWO

Weekly Journal Writing Guidelines

for

REFLECTION ON CLASSROOM TEACHING

Date

==========

Name_____ Class ___ School_____

Duration of lesson _____ Class size _____ Week of TP_____

==========

During your Teaching Practice, please select FIVE classroom episodes to reflect upon. For each 'significant' episode (which contains problematic teaching/learning concepts /issues, or problematic management issues), reflecet on it based on a few of the following questions. Please write at least one page of your reflection and keep it in the Teaching File.

1. Why is the classroom episode significant to you ?

2. Did you plan for particular things to happen, and, how did things happen ?

3. Did you use any particular principles in planning the lesson / unit? What is it and why ?

4. Did any personal, social, political, ethical and moral issues surface during the episode ? Please elaborate.

5. Did you observe any change in your pupils? (e.g. increase in knowledge, awareness and understanding of specific facts, concepts, principles, institutions) Why ?

6. Do you see a connection between the pupils' change and your own understanding of the pupil, or the situation, or the class ? Why?

7. What do you wish could have happened ?

Thank you.